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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,387	10/17/2005	Agnes Dutron	VANM262.001APC	8653

20995 7590 12/09/2010  
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EXAMINER	
BADR, HAMID R	

ART UNIT	PAPER NUMBER
1781	

NOTIFICATION DATE	DELIVERY MODE
12/09/2010	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com  
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### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/22/2010 has been entered.

The research articles presented as Exhibit A and B have been considered.

Claims 1, 2, 4, 7-12, 16-18, 20 and 23-28 are being considered on the merits.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 7-12, 16-18, 20 and 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gil et al. (1999, Keeping qualities of white pan bread upon storage: effect of selected enzymes on bread firmness and elasticity; hereinafter R1) in view of Collins et al. (2002, A novel family 8, functional and physicochemical characterization; hereinafter R2), Gerday et al. (2000, Cold-adapted enzymes: from fundamentals to biotechnology, hereinafter R3) and Fuglsang et al. (WO 02/19828; hereinafter R4)

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3. R1 discloses the incorporation of endo-1,4-xylanase together with amylase, maltogenic amylase and lipase into a bread dough comprising all other bread ingredients. (page 395, col. 2, materials and methods)
4. R1 discloses that addition of xylanase to the bread dough causes an increase in loaf volume. (page 394, col. 2, last paragraph)
5. R1 is silent regarding the xylanase from *Pseudoalteromonas haloplanktis*.
6. R2 discloses xylanase enzyme belonging to family 8. The xylanase disclosed hydrolyses xylan to xylotriase and xyloteraase and is most active on long chain xylo-oligosaccharides. (Abstract).
7. The xylanase disclosed by R2, hydrolyzes with inversion of configuration. The source of the enzyme is *Pseudoalteromonas haloplanktis* (Abstract).
8. R2 characterizes the xylanase from this organism as having a molecular mass of about 46000 Daltons, an isoelectric point of about 9.5. an optimum pH for activity between about 5.3-8 and an optimum temperature of 35C (R2, Table 1) as presently claimed.
9. While R1 discloses the use of xylanase in the baking industry and R2 discloses other sources and types of xylanases, R1 or R2 are silent regarding the use of psychrophilic xylanase in baking processes.
10. R3 discloses that "in baking processes, enzymes such as amylases, proteases, and xylanases can be used to reduce the dough fermentation time, improve the properties of the dough and the crumb, in addition to the retention of aromas and moisture levels. These enzymes act directly on starch, gluten and hemicelluloses to

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palliate the low level of intrinsic enzyme activities in the flour. The use of psychrophilic enzymes [i.e. the presently claimed xylanase] can be advantageous not only for their high specific activity, thereby reducing the amount of enzyme needed, but also for their easy inactivation. " (page 106, second column, lines 4-15). Then in light of this motivation for using psychrophilic enzymes, including xylanase, it would have been obvious to screen and purify the xylanase from a psychrophilic source, as presently claimed, using conventional techniques in the art and apply the xylanase in baking as known in the art. One would definitely expect to see the effect of such a xylanase on improving the bread quality as disclosed by R1.

11. Despite the fact that applicants have provided a specific xylanase belonging to family 8 from the strain disclosed and claimed, this does not provide a patentable distinction over those xylanases disclosed by R2 (identical xylanase) as also having endo-xylanase activity with the same type of reaction on xylans and hemicelluloses, and the xylanases disclosed by R1 resulting in an increase in loaf volume, except for the optimum temperature for activity. Absent any clear and convincing evidence and/or arguments to the contrary, alternatively, given the specific teachings of R1 and R2 and R3; one would have been motivated to routinely screen out the identified xylanases from other sources and utilize such xylanases within the known methods of R1 for the same purpose of increasing the loaf volume as presently claimed.

12. R1, R2 and R3 are silent regarding compositions comprising one or more enzymes.

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13. R4 discloses a composition comprising one or more enzymes and also discloses a method for improving one or more properties of a dough, also a method for preparing a baked product and to a dough and/or a baked product produced thereby. (Abstract)

14. R4 discloses the incorporation of carbohydrases including xylanases, oxidoreductase, amylases, proteases, lipases to the composition for baking purposes (page 10, lines 1-37 and page 11, lines 1-37). It is noted that  $\alpha$ -amylase is a fungal amylase from *Aspergillus oryzae*. To support this position, the applicant is referred to US patent number 6,110, 508 for the details of fungal amylase in baking (Col. 5, line 64 to col. 6, line 7).

15. R4 discloses the role of amylases to standardize the flour from the view point of amylolytic activity. Amylases and pentosanases generally provide sugar for the yeast fermentation, improve the bread volume, retard retrogradation (maintain crumb softness) and decrease the staling rate and stickiness that results from pentosan gums (page 12, lines 5-11).

16. R4 discloses that fungal  $\alpha$ -amylases may be used to improve the bread volume and to provide a good and uniform structure of the bread crumb. (page 12, lines 22-24).

17. R4 discloses that enzyme preparations containing a number of pentosanase and hemi-cellulase activities can improve the handling and stability of the dough, improve the freshness, the crumb structure and the volume of the bread. (page 12, lines 33-36).

18. R4 teaches combining  $\alpha$ -amylase and hemicellulase in a dough composition. In a particular embodiment the hemicellulase is a pentosanase such as xylanase. (page 13,

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lines 6-10). The xylanase is preferably of microbial origin e.g. derived from bacteria or fungi.

19. R4 gives an example where an encapsulated xylanase is used in baking. Other ingredients include water, flour, yeast, sugar, salt, ascorbic acid. The encapsulated enzyme was dispersed in water. The ingredients are combined and the dough is mixed (page 26, Example 3 to page 27 line 2). Other ingredients, including gluten, may also be added to the dough (page 22, lines 24-37).

20. R4 discloses the stabilizing or protective agents that can be used with enzymes including organic acids, inorganic salts, sugars etc. (page 21, line 31—page 22, line 7)

### ***Response to Arguments***

Applicants' arguments have been thoroughly reviewed. These arguments are not persuasive for the following reasons.

1. Applicants argue that due to the considerable variation in the structures and activities of xylanases and to the limited number of xylanases utilized in the baking industry, one skilled in the art would not have a reasonable expectation that the family 8 xylanases as presently claimed would be effective in a bread improver composition.

a. A thorough review of the references cited above would lead a person of ordinary skill in the art to try the identical xylanase of R2 in baking processes. Since this xylanase is also an endo-1,4-xylanase, it will perform the same action on wheat xylans as disclosed by R1. R3 clearly sets forth the motivation for using a psychrophilic xylanase in baking processes.

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Applicants have emphasized on the “family 8” xylanase terminology. This terminology does not add to the patentability of the subject matter; because the classification of xylanases into various families is based on primary structure comparisons of the catalytic domains only and groups the enzymes in families of related sequences.

It should be realized what appears to be important and relevant is the activity of the xylanases as endo-1,4-xylanase. As such, R1 and R4 disclose the role of such activity in the bread dough.

2. Applicants argue that there are hundreds of different xylanases and only a small fraction of these are suitable for use in the baking industry. Accordingly, the discovery of another particular xylanase capable of use in baked products would be an unexpected result.

a. The rejection is an obviousness type rejection in which R1 discloses the role of xylanase on the quality of the baked product. R2 discloses a xylanase identical to the presently claimed psychrophilic xylanase. R3 clearly states that psychrophilic enzymes, including xylanases, would be advantageous in baking processes. Therefore, it is clear that adding such a xylanase to the dough would result in improving the quality of the baked product. This is an expected result contrary to applicants’ belief.

3. Applicants argue that R1 uses a family 11 xylanase in baking, R2 does not discuss baking at all, R3 gives a list of psychrophilic enzymes and R4 discloses the addition of numerous enzymes including xylanases and that none of these references discloses or suggests a family 8 xylanase as presently claimed.



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a. The rejection set forth in this Office action is an obviousness type rejection based on four references.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAMID R. BADR whose telephone number is (571)270-3455. The examiner can normally be reached on M-F, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hamid R. Badr  
Examiner  
Art Unit 1781

/Keith D. Hendricks/

Supervisory Patent Examiner, Art Unit 1781